



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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July 27, 2015

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RE: Comments on Veolia's Sampling and Analysis Plan for Frank Holton Lakes

Dear Mr. Dragovich;

We are pleased to respond to your inquiry regarding Veolia's "Sampling and Analysis Plan with Quality assurance Project Plan for the Frank Holten State Park Lakes" submitted August 9, 2011. We strongly encourage that sampling data used to justify a permit action be appropriate and useable for a specific decision. To ensure the collection of quality data, we ask that you consider the following recommendations to modify the sampling and analysis plan.

Overview

Overall, Veolia's Sampling and Analysis Plan is deficient in three areas. First, the specific goals and objectives of the study need to be clearly defined in the plan. Secondly, the plan must layout how the data will be used within the context of the risk assessment and the permit. Finally, the report must contain specific content including selected analytical laboratory, laboratory specific SOPs and identification of key personnel under project organization.

The stated goals of the sampling proposal are briefly mentioned on page 2 as to "obtain total mercury concentrations [within fish]", and "to determine the trophic levels of the fish analyzed [via stable nitrogen isotope ratios]." Mercury analysis will also be conducted on water and sediment. Aside from the analysis of stable nitrogen isotopes for determining trophic levels, the report does not mention what the mercury data in fish, water, and sediment will be used for in the context of Veolia's permit. Section 5 mentions that two sizes of a given fish species will be sampled in order to determine the size dependence of mercury contamination. How this data will

be used in the context of the permit is not mentioned. Section 5 further describes the plan as “monitoring of a wide variety of habitats, feeding strategies, and physiological factors that could result in differences in bioaccumulation of contaminants” but does not describe how this information will be used within the context of the permit.

Subsequent electronic messages from Veolia explain that the data collected will be used to:

Goal 1) “determine the actual trophic level . . .

Goal 2) and [determine] mercury concentrations in the fish.”

Goal 3) “determine Veolia’s and other industries’ impact, if any, on these lakes over the past thirty years.”

Veolia does not describe how achieving Goal 2) will change the forward-looking risk assessment which is based on maximum potential emissions allowed under the MACT rule. Furthermore, it is unclear how any of the data collected will be used to support Goal 3). EPA does not believe the data collected can be used for these goals. Since the site-specific risk assessment is based on future potential releases allowed and documented under a permit limit, conjecture as to past impacts is irrelevant.

Goal 1), the determination of trophic level via stable nitrogen isotopes, could be used to alter the risk assessment’s assumption for top trophic level. The top trophic level assumption is used to select a bioaccumulation factor (BAF) for converting estimated lake mercury concentrations into a human exposure through fish ingestion. Unfortunately, the sampling proposal does not include enough sampling to appropriately apply the stable nitrogen isotopes methodology (Appendix 1, Comments of Joel Hoffman, Ph.D.). To use this approach when the fish in question can and likely do avail themselves of different types of food chains within a single lake, a host of other organisms (representatives of all of the other food chain elements) must also be sampled and analyzed. The comprehensive nature of what is required for stable nitrogen isotopes methodology seems to be well beyond the scope of this project.

Alternatively, the types of samples and data proposed could be used to determine site-specific BAFs which could then be substituted into the risk assessment for reevaluation (provided the proposal is approvable in consideration of the remaining comments herein). The trophic level evaluation proposed would ultimately lead to the assignment or weighting of default BAFs to adjust for the specific lakes. A more direct way to incorporate site-specific trophic levels is to bypass them and directly measure BAFs (Appendix 2, Comments of Christopher Knightes). BAFs can be estimated from measurements in fish and water only and do not require analysis of sediment and other food chain organisms.

The lake study must identify not only the data to be collected, but also its explicit purpose, including exactly how it will be used to support the project’s goals. For example, the current proposal (and subsequent electronic messages) indicates that actual trophic level will be determined. However, there are many different species of fish in the lakes. Will the study identify the top trophic species for risk assessment purposes? Potentially what new trophic level

will be identified and how will it be used in the context of the permit? Will it be substituted into the risk assessment? If multiple trophic levels are determined, by size within a species for example, which one will be selected to compare the risk assessment? The intended use of the data collected must be explicitly described in order to confirm that the goals are appropriate and supported by the proposed sampling.

General Comments

1. Please clearly define the objectives of the study and clearly explain how the results may be used to make environmental decisions.
2. When preparing a QAPP, please include the elements described in the United States Environmental Protection Agency's (U.S. EPA) "Guidance for Quality Assurance project Plans (EPA QA G-5)" which is available at the following U.S. EPA web site: <http://www.epa.gov/quality/qs-docs/g5-final.pdf>.
3. Include on the Title page the Veolia's company name, U.S. EPA ID number, the date generated and the name of the company who prepared the report.
4. Provide the persons' name and companies in the organizational structure.
5. Provide the laboratories' information including name, key personnel biographies, certifications and standard operation procedures (SOPs) for all sampling and analysis tasks.
6. Provide information on independent data validation procedures.
7. Include data, rational and statistical calculations in determining number of samples required to meet objectives for all media.
8. Provide for advanced notice of field activities such that state and/or federal personnel may attend sampling activities. Also, provide for split samples in the sampling proposal.
9. Please account for fish stocking events and any other factors when scheduling sampling activities. Please reference input from state and federal fish and wildlife agencies when appropriate.

Specific Comments

Section 1.0 Project Description and General Overview

Please describe exactly what the various data collected will be used for. The proposal does not explicitly describe specific objectives. For example, three lakes are sampled independently, however, the proposal does not describe how the three lakes would be compared to each other or to the existing risk assessment/permit (Appendix 1, Comments of Joel Hoffman, Ph.D.) Please provide references for any information provided (i.e. where did the list of fish species for each lake come from?).

Section 3.1 Precision

Please increase the duplicate sample collection rate to 10% (Appendix 3, Comments of Tom Hornshaw).

Section 3.6 Method Detection and Quantitation Limits

One of the primary functions of this proposal should be to ensure that analytical methods have sufficient sensitivity for the task at hand. The proposed plan should provide a discussion for anticipated detection limits (Appendix 3, Comments of Tom Hornshaw). While we recognize that methylmercury and total water column mercury might not be readily available for this waterbody, there are previous detections in fish. The previous detections of mercury in fish should be considered in establishing detection and reporting limits in fish for this analysis. Furthermore, the default BAFs and methylation ratios for methylmercury to total water column mercury can be used in conjunction with previous detections of mercury in fish of these lakes to estimate the concentrations in water that may be present. These estimates can be compared with contingency to expected detection and reporting limits. Please plan for at least 80% detection rates when selecting analytical methodology.

Section 5.2.3.1 Fish

It is not clear why two samples of bottom-feeding fish will be collected. Please describe in detail how this information will be used in the context of the permit and/or risk assessment. Also, compositing of fish samples within species and size category is an effective means of reducing variability in the sample set. Please consider compositing instead of grab sample analysis. If compositing is selected, the sample should comprise equal weights of ground tissue from each fish within a species and size category.

The IEPA recommends analyzing skin-on scaled filets for bass, crappie, and carp samples and skin-off filets for the channel catfish (Appendix 3, Comments of Tom Hornshaw).

Section 5.2.3.2 Water

In the event that you choose to establish site-specific BAFs, water samples must be collocated within the *home range* of the fish caught. For example, one method for estimating *home range* shows that a 14-inch largemouth bass (the minimum size allowed for keeping) could have a *home range* of approximately 13 acres. Since the lakes here are much larger than 13 acres, samplers should take care to keep the water sampling locations within that area. It may be beneficial to consult with the local or state agencies which have previously sampled fish here as to where the good collection sites are located. An ideal location for fish and water samples within these lakes would be where the fish are primarily living and eating and where humans are regularly catching them. Please consider *home range* in determining water and fish sampling locations. A methodology is available in the September 2009 *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000) Technical Support Document Volume 3: Development of Site-Specific Bioaccumulation Factors*, EPA- 822-R-09-008, U.S. EPA Office of Water and Office of Science and Technology.

The 2009 site-specific BAF guidance indicates that one can use the ratio of the 90th to the 10th percentile values (Confidence Limit Ratio – CLR) from the results of BAF measurements and that this ratio should be 5 or less. Measures of this ratio for BAFs tend to tighten up once the number of fish and water samples are up to 6-10 samples each. Please increase the number of water samples to 6 or more per lake.

Compositing of multiple samples is an effective means of reducing variability in the sample set. Please consider compositing instead of grab sample analysis.

Section 5.2.3.3 Sediment

It is not clear how sediment data will be used in the context of the permit or risk assessment. Please explicitly describe how sediment data will be used.

Section 5.2.4 Number of Samples and Table 5-2

It is not clear how the number of fish samples was selected and how it relates to expected precision, accuracy, and representativeness. The 2009 site-specific BAF guidance indicates that one can use the ratio of the 90th to the 10th percentile values (CLR) from the results of BAF measurements and that this ratio should be 5 or less. Measures of this ratio for BAFs tend to tighten up once the number of fish and water samples are up to 6-10 samples each. Please increase the number of fish species in a given size category to 6 or more per lake (Appendix 2, Comments of Christopher Knightes).

It is not clear that the species or sizes chosen are the ones most likely to be consumed from the lake or otherwise why they are chosen (Appendix 1, Comments of Joel Hoffman, Ph.D., and Appendix 2, Comments of Christopher Knightes). Please include a summary of legal harvestable size requirements for all species to be collected. If some of the target species do not have legal size limitations, please discuss and prescribe a limit on consumable size and provide the rationale. These size targets must be established before sampling. If field conditions warrant changes in the size targets, this can be documented at the time.

If fish data is to be aggregated in any way, the aggregations must be species specific and the length of the smallest fish in an aggregate category must not be less than 75% of the length of the largest fish in that category. If two size categories will be sampled (within the same species), ensure that the larger size is at least an order of magnitude and as much as 30 times larger by weight than the smaller category (Appendix 2, Comments of Christopher Knightes). While this requirement may not apply to bass due to the minimum size for keeping, it may be applicable to the other target species. Historical large-size categories are presented by IEPA in attached comments (Appendix 3, Comments of Tom Hornshaw).

Section 5.5 Sediment Sampling

It is not clear exactly how sediment data will be used in this study . Also, sediments are typically very heterogeneous and any attempt to characterize sediments necessarily have high numbers of samples (Appendix 2, Comments of Christopher Knightes). How were two samples and a replicate determined to be sufficient? Since we do not know how sediment data will be used, we cannot determine what type and scale of sampling is most appropriate. If sediment data will not be used for any quantitative purpose, it may not be worth collecting.

The purpose for the procedure that divides the sediment core into 2-centimeter lifts is not explained. How will the 2-centimeter lifts be evaluated? What if different sediment types are present and do not match the 2-centimeter breakdown? Please explain why this information is being collected and how the data will be used in the context of the permit.

Section 6.3.2.1 Fish Samples

The proposal implies that fish fillets destined for stable nitrogen isotope analysis are to be oven dried. Please ensure that fish fillets destined for any type of mercury analysis are not oven-dried prior to analysis.

Section 8.1.2 Mercury in Water

In the event the water data is to be used for determining site-specific BAFs, we need to consider other factors for the water analysis. The default BAFs used in the risk assessment are based on freely dissolved methylmercury in water. If we are to modify the risk assessment for site-specific BAFs, we must ensure we have the information to make a valid comparison. It appears you are determining total water column mercury and methylmercury concentrations. Some of the total water column methylmercury will be freely dissolved. Some will be associated with dissolved organic carbon (DOC) and particulate organic carbon (POC) within the water column. There are techniques for filtering the water samples to ensure that the result will be representative of the freely dissolved fraction. Please plan for collecting samples for both filtered (freely dissolved) and total water column for methylmercury (Appendix 2, Comments of Christopher Knightes). In the event the water data is to be used for determining site-specific BAFs, please describe how these factors will be evaluated, converted, sampled, and/or analyzed such that the data will be useable for the permit and risk assessment.

Methylmercury in water will have a pronounced temporal variability and should be sampled several times during the year. One recommendation from a reviewer was to sample at 5 different times. The samples must include water samples from late-spring/early summer and late summer/early fall (Appendix 2, Comments of Christopher Knightes).

Section 8.2 Trophic Levels of Fish

The sampling proposal does not include enough sampling to appropriately apply the stable nitrogen isotopes methodology (Appendix 1, Comments of Joel Hoffman, Ph.D.) To use this approach when the fish in question can and likely do avail themselves of different types of food

chains with a single lake, a host of other organisms (representatives of all of the other food chain elements) must also be sampled and analyzed. Please provide for the collection and analysis of other foodchain organisms in order to use this methodology.

Appendix A-1 Example Field Record Form for Fish

Please include a wet weight if determining trophic level by stable nitrogen isotopes (Appendix 1, Comments of Joel Hoffman, Ph.D.).

Appendix A-2 Example Field Record Form for Water

The form should include the sample depth and whether the sampled depth is part of the epilimnion, metalimnion, or hypolimnion. Since pH is an important parameter for mercury accumulation, pH of the lake water should also be recorded. (Appendix 1, Comments of Joel Hoffman, Ph.D.). Please account for appropriate instrument procedures and calibration if pH will be measured in the field.

If you have any additional questions, please contact me at the address above or at (312) 886-3583.

Sincerely,

Christopher Lambesis, Environmental Scientist
Todd D. Ramaly, Environmental Scientist
RCRA Programs Section
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Attachments